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two; Zeuglodonta, two; Cetacea, forty-four. There are several species described for the first time, and the literary references are very complete. The system adopted by Dr. Leidy requires some comment. He adopts the order Bimana, a step which we regard as retrograde, since modern investigations, fresh in the mind of every student, have proved beyond cavil that that group is subordinate to the order Quadrumana. The division of Artiodactyla into Ruminantia and Artiodactyla as orders, ranking with other groups so-called, on the presence or absence of the functional peculiarity of rumination, is also contrary to the philosophy of a homological system. The separation of the Pinnipedia from the Carnivora has in the same manner little better foundation. The adoption of the Zeuglodonta as an order is perhaps a step forward, though in that case the Squalodons, which embrace ten of the twelve species included, must certainly be referred to the Cetacea. The separation of the Sirenia as an order has met with favor from Owen and others, and is well adopted in the present work.

THE EARLIEST EVIDENCES OF PLANT-LIFE.\*—In this pamphlet Professor Dawson reviews the different substances which have been supposed to show that plants existed contemporaneously with the Eozoön in the Laurentian of Canada.

"We may sum up these facts and considerations in the following statements:—First, that somewhat obscure traces of organic structure can be detected in the Laurentian graphite; secondly, that the general arrangement and microscopic structure of the substance corresponds with that of the carbonaceous and bituminous matters in marine formations of more modern date; thirdly, that if the Laurentian graphite had been derived from vegetable matter, it has only undergone a metamorphosis similar in kind to that which organic matter in metamorphosed sediment of later age has experienced; fourthly that the association of the graphitic matter with organic limestone, beds of iron ore, and metallic sulphides greatly strengthens the probability of its vegetable origin; fifthly, that when we consider the immense thickness and extent of the Eozoöal and graphitic limestones and iron-ore deposits of the Laurentian, if we admit the organic origin of the limestone of graphite, we must be prepared to believe that the life of that early period, though it may have existed under low forms, was most copiously developed, and that it equalled, perhaps surpassed, in its results, in the way of geological accumulation that of any subsequent period."

FOSSIL BIRDS.†—In this little pamphlet Professor Marsh imposes a new obligation on the science of Paleontology, by the discovery of five species of Cretaceous birds. Among the species there is one, *Paleotringa vetus*, described from the original specimen found by Dr. Morton. This is the first fossil bird bone found in this country, and though referred to by Dr. Morton in his Organic Remains of the Cretaceous period, has been hitherto considered a recent specimen, which by some accident had been buried in the Cretaceous marl deposits. The forms embrace one large swimming bird (*Laornis Edwardsianus*), two gulls (*Paleotringa littoralis*

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\* On the Graphite of the Laurentian of Canada. By J. W. Dawson, LL. D., etc. Proceedings of the Geological Society, Postponed Papers, Vol. xxvi, Part 1. Pamphlet, pp. 5.

† Notice of the Fossil Birds from the Cretaceous and Tertiary Formations of the United States. By Professor O. C. Marsh. From American Journal of Science and Arts. March, 1870. Pamphlet, pp. 16.

and *P. vetus*), and two rails (*Telmatornis priscus* and *T. affinis*). Besides these there are descriptions of four species of Tertiary birds, the first that have been regularly described from that formation in this country. These are said to be more closely allied to existing species than those of the Cretaceous. They are *Puffinus Conradi*, *Catarractes antiquus*, *Grus Haydeni*, and *Graculus Idahensis*.

Though the discovery of that remarkable bird, the Archæopteryx, in the Jurassic beds, led naturalists to suppose that Cretaceous forms would be eventually discovered, to Professor Marsh's energy we owe the fulfilment of these anticipations.

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## NATURAL HISTORY MISCELLANY.

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### BOTANY.

HIBERNATION OF DUCK-WEED. — It has long been known that some species of *Lemna*, or duck-weed, produce, at the approach of winter, leaves of a different character to those formed in the spring, which fall to the bottom of the pond or stream, enabling the plant to live through the winter. A series of more accurate observations on this point is recorded by M. Van Hoven in the "Bulletin de la Société Royale de Botanique de Belgique." The species of *Lemna* indigenous to Belgium are the same as those found in this country; of these M. Van Hoven finds that two only, the *L. polyrhiza* and *gibba*, produce leaves of a different form in winter; while with the three other species, *L. minor*, *trisulca*, and *arrhiza*, the ordinary leaves live through the winter, remaining on the surface. In *L. polyrhiza* these winter-leaves first make their appearance in August or September. They are much smaller than the ordinary leaves, reniform or sometimes elliptical, olive-brown on both sides, and not gibbous beneath; their roots are exceedingly minute, and at first hidden within the leaf. The aëriferous cells which serve to support the ordinary leaves on the surface do not exist, causing the winter leaves to resemble an undeveloped bud. In consequence of the absence of these vessels they are heavier than the water, and fall to the bottom as soon as any agitation of the water detaches them from the parent leaf, which perishes with the first frost. At the ordinary period of the revival of vegetation, a small bubble of oxygen appears on the upper surface of these submerged leaves, which carries them to the surface, from which they again descend should the temperature fall below a certain point. In *Lemna gibba*, leaves of a similar character were observed hibernating beneath the water, differing in shape, size, and structure from those developed during the summer. — *Quarterly Journal of Science*.